



**THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re the Application of: Tetsuro YAMATE

Group Art Unit: 1712

Application Number: 10/820,844

Examiner: Daniel S. Metzmaier

Filed: April 9, 2004

Confirmation Number: 8680

For: CHEMILUMINESCENT COMPOSITION

Attorney Docket Number: 030486

Customer Number: 38834

**DECLARATION UNDER 37 CFR §1.132**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

September 29, 2007

Sir:

I, Tetsuro Yamate, hereby declare and state that:

(1) I am an inventor of the invention described in US Serial Number 10/820,844. I have been engaged in research of a chemiluminescent composition and chemiluminescent device at Lumica Corporation from 1993 to the present.

(2) I am an inventor of United States Patent Application Serial No. 10/820,844. I am familiar with the contents of the United States Patent Application Serial No. 10/820,844 filed on April 9, 2004 and the cited references including Cranor (USP 7,052,631) and Omniglow (WO94/19421).

(3) I prepared a declaration under 37 CFR §1.132 which I signed on June 8, 2007 and submitted on June 12, 2007. I have read the outstanding Office Action mailed on June 29, 2007. The Examiner maintains the outstanding rejection because the Applicant's argument of unexpected results is

unpersuasive because Omniglow clearly suggests the use of "citrates" "in the oxalate/fluorescent composition" (Section 19 of the outstanding Office Action).

(4) Omniglow suggests "citrates," but I disagree with the Examiner because Omniglow does not disclose the citrates "in the oxalate/fluorescent composition."

(5) I have understood that Omniglow teaches acetyl trialkyl citrates and trialkyl citrates (Page 3, lines 13-23 of Omniglow). The specific citrates disclosed by Omniglow are triethyl citrate, acetyl triethyl citrates and acetyltributyl citrate (Table 1).

(6) Thus, I have carried out Test 1 and Test 2 below, to show unexpected results in using acetyltributyl citrate over triethyl citrate, acetyltriethyl citrates "in an oxalate/fluorescent composition."

(7) Preparation of the Samples 1-5

Using dibutyl phthalate (DBP), acetyltributyl citrate (ATBC), acetyltriethyl citrate (ATEC), tributyl citrate (TBC) and triethyl citrate (TEC), chemiluminescent compositions including 1-chloro bis(phenylethynyl)anthracene (1-c BPEA) (corresponding to the claimed "fluorescent material") and bis(2,4,5-trichloro carbopentoxyphehyl) oxalate (CPPO) (corresponding to the claimed "oxalate") were prepared in the same manner as described in the specification to obtain Samples 1-5 as follow:

0.0074 mol of 1-chloro bis(phenylethynyl)anthracene (1-c BPEA) and 0.08 mol of bis(2,4,5-trichloro carbopentoxyphehyl) oxalate (CPPO) were added to 1 L of dibutyl phthalate (DBP), which was then heated to obtain Sample 1.

0.0074 mol of 1-chloro bis(phenylethynyl)anthracene (1-c BPEA) and 0.08 mol of bis (2,4,5-trichloro carbopentoxyphehyl) oxalate (CPPO) were added to 1 L of acetyltributyl citrate (ATBC), which were then heated to obtain Sample 2.

0.0074 mol of 1-chloro bis(phenylethynyl)anthracene (1-c BPEA) and 0.08 mol of bis (2,4,5-trichloro carbopentoxyphehyl) oxalate (CPPO) were added to 1 L of acetyltrietyl citrate (ATEC), which were then heated to obtain Sample 3.

0.0074 mol of 1-chloro bis(phenylethynyl)anthracene (1-c BPEA) and 0.08 mol of bis (2,4,5-trichloro carbopentoxyphehyl) oxalate (CPPO) were added to 1 L of tributyl citrate (TBC), which were then heated to obtain Sample 4.

0.0074 mol of 1-chloro bis(phenylethynyl)anthracene (1-c BPEA) and 0.08 mol of bis (2,4,5-trichloro carbopentoxyphehyl) oxalate (CPPO) were added to 1 L of triethyl citrate (TEC), which were then heated to obtain Sample 5.

(ii) Preparation of Oxidizing Liquid

An oxidizing liquid including hydrogen peroxide was prepared in the same manner as the description at page 4, lines 14-16 of the specification of the present application.

(iii) Test 1

Samples 1-5 were kept at 23°C. 0.42 cc of the oxidizing liquid was mixed with 0.84 cc of the solutions of Sample 1-5 to induce luminescence. The decay of the luminescent intensity was measured in the same manner as the description at page 4, lines 3-10 of the specification. The decay was measured at 23°C. The result is shown in Table 1 below. Table 1 includes comparison of the values of ATBC,

ATEC, TBC, and TEC with that of DBP.

Table 1

time (minutes)	2	15	60	120	180	240	300	360
Sample 1 using DBP	37210	26356	14794	6749	3245	1710	889	496
Sample 2 using ATBC (Compared with DBP)	36407 98%	26073 99%	15696 106%	6945 103%	3185 98%	1637 96%	849 96%	502 101%
Sample 3 using ATEC (Compared with DBP)	31391 84%	22492 85%	12959 88%	5413 80%	2434 75%	1311 77%	651 73%	344 69%
Sample 4 using TBC (Compared with DBP)	28598 77%	21802 83%	11837 80%	5546 82%	2411 74%	1064 62%	454 51%	229 46%
Sample 5 using TEC (Compared with DBP)	23633 64%	18153 69%	12789 86%	6064 90%	2656 82%	1087 64%	324 36%	125 25%

Measurement at 23°C

Luminescent Intensity: candela (mcd/m<sup>2</sup>) (measured by a luminance meter available from Minolta Camera Co. Ltd., Japan)

(iv) Test 2

Samples 1-5 were kept at a temperature of 60°C for a period of one week. Then, 0.42 cc of the oxidizing liquid was mixed with 0.84 cc of Samples 1-5 to induce luminescence. The decay of the luminescent intensity was measured in the same manner as the description at page 4, lines 3-10 of the specification. The decay was measured at 23°C. The reasons why I stored Samples 1-5 at 60°C is that Omniglow discloses that the samples were evaluated "after accelerated aging (Table 1 of Omniglow)." Omniglow does not disclose how the samples were subjected to "accelerated aging," but I believe that storage at 60°C is enough to accelerate the aging of the samples compared with the condition carried out in Test 1. The results of Test 2 are shown in Tables 2 and 3 below.

Table 2 includes comparison of the results between Test 1 and Test 2. In particular, the values of DBP, ATBC, ATEC, TBC and TEC obtained in Test 2 are compared with those of DBP, ATBC, ATEC, TBC and TEC obtained in Test 1, respectively. In other words, the comparison in Table 2 shows

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the effects by “accelerated aging.”

Table 3 includes comparison with DBP in Test 2. In detail, the values of ATBC, ATEC, TBC and TEC obtained in Test 2 are compared with that of DBP obtained in Test 2.

Table 2

time(minutes)	5	15	60	120	180	240	300	360	Ave.
Sample 1 using DBP (Compared with DBP value obtained in Test 1)	35322 95%	26102 99%	14767 100%	6540 97%	3145 97%	1701 99%	860 97%	512 103%	98%
Sample 2 using ATBC (Compared with ATBC value obtained in Test 1)	35679 98%	25848 99%	14596 93%	6528 94%	3058 96%	1588 97%	824 97%	492 98%	97%
Sample 3 using ATEC (Compared with ATEC value obtained in Test 1)	26682 85%	19793 88%	11663 90%	4709 87%	2166 89%	1075 82%	525 81%	276 80%	85%
Sample 4 using TBC (Compared with TBC value obtained in Test 1)	12267 43%	7958 37%	3610 30%	1388 25%	573 24%	264 25%	108 24%	55 24%	29%
Sample 5 using TEC (Compared with TEC value obtained in Test 1)	22750 96%	16126 89%	8875 69%	2143 35%	383 14%	105 10%	36 11%	20 16%	43%

Measurement at 23°C

Luminescent Intensity: candela (mcd/m<sup>2</sup>) (measured by a luminance meter available from Minolta Camera Co. Ltd., Japan)

Table 3

time(minutes)	5	15	60	120	180	240	300	360	Ave.
Sample 1 using DBP	35322	26102	14767	6540	3145	1701	860	512	
Sample 2 using ATBC (Compared with DBP value obtained in Test 2)	35679 101%	25848 99%	14596 99%	6528 100%	3058 97%	1588 93%	824 96%	492 96%	98%
Sample 3 using ATEC (Compared with DBP value obtained in Test 2)	26682 76%	19793 76%	11663 79%	4709 72%	2166 69%	1075 63%	525 61%	276 54%	69%
Sample 4 using TBC (Compared with DBP value obtained in Test 2)	12267 35%	7958 30%	3610 24%	1388 21%	573 18%	264 16%	108 13%	55 11%	21%
Sample 5 using TEC (Compared with DBP value obtained in Test 2)	22750 64%	16126 62%	8875 60%	2143 33%	383 12%	105 6%	36 4%	20 4%	31%

Measurement at 23°C

Luminescent Intensity: candela (mcd/m<sup>2</sup>) (measured by a luminance meter available from Minolta Camera Co. Ltd., Japan)

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(8) I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like are punishable by fine or imprisonment, or both, under the laws of the United State and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Tetsuro Yamate  
Tetsuro Yamate

September 29, 2007

                      
Date